

STUDIES IN THE GENUS *STREPTANTHUS* NUTT.  
I. TWO NEW SPECIES IN THE SECTION  
*EUCLISIA* NUTT.

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During the course of monographic studies in *Streptanthus* it has become necessary to describe two hitherto unrecognized species. The decision to recognize the following as new species was based on differences in the structure, shape, size and color of organs as well as upon geographic distribution. The fused filaments of the upper and lower pairs of stamens, the obtuse, crisped petal blade, the non-bracteate inflorescence, and the annual duration of the plants indicate the close relationship between these species and the others at present included in Section *Euclisia*.

*Streptanthus batrachopus* sp. nov. Herba annua omnino glabra glaucaque maculata; caules erecti simplices vel superne ramosi, 4.0–18.0 cm. alti; folia pauca, plerumque basalia crassa, subtus purpurea, supra fulva vel purpureo-maculata, 0.3–3.2 cm. longa, 0.2–1.0 cm. lata; folia inferiora, spatulato-obovata vel oblonga, saliente lobata, petiolis longis; folia superiora sessilia auriculata amplexicaulia, lineari-lanceolata vel oblonga, sub-integra; flores erecti, 0.4–0.5 cm. longi; sepala 0.4 cm. longa, viridia purpureave, ovata, basi carinata, apicibus patentibus acutis, marginibus hyalinis, saepe rubescentibus; petala valde exserta alba, venis mediis purpureis, lineari-lanceolata spatulatae, acuta 0.6–0.7 cm. longa; stamina triseriata, superiorum filamentis 0.6 cm. longis ad apicem connatis, antheris reductis, inferiorum filamentis 0.5 cm. longis, usque ad 0.2–0.3 cm. connatis, antheris longioribus, lateralium filamentis 0.3 cm. longis, liberis, approximatis, antheris longissimis; siliquae 2.5–3.0 cm. longae, erectae, leviter torulosae, falcatae, apicibus patentibus, virides purpureo-maculatae; stylus 0.1 cm. longus; stigma integrum; pedicelli 0.2–0.3 cm. longi, adscendentes; semina fulva, striato-reticulata, alata, 0.2 cm. longa; cotyledones accumbentes.

Annual; stem erect, simple or branched above, entire plant glabrous and glaucous, mottled, 4.0–18.0 cm. high; leaves few, mostly basal, thick, purple beneath and brown or purple spotted above, 0.3–3.2 cm. long; 0.2–1.0 cm. wide; lower leaves long-petioled, spatulate-obovate to oblong, saliently-lobed; upper leaves sessile, auriculate-clasping, linear-lanceolate to oblong, sub-entire; flowers erect, 0.4–0.5 cm. long; sepals green or purple, ovate and keeled at base, narrowed above, tips spreading, margins hyaline or reddish, 0.4 cm. long; petals well exserted, white with purple midvein, linear-lanceolate to spatulate, acute, 0.6–0.7 cm. long; stamens in three pairs, anthers saggitate; upper pair 0.6 cm. long, filaments connate to the apex, anthers reduced;

lower pair 0.5 cm. long, filaments connate for about half to two-thirds their length, anthers longer; lateral pair free, approximate, 0.3 cm. long, anthers longest; silique 2.5–3.0 cm. long, erect, falcate-spreading, slightly torulose, green, spotted with purple, style about 0.1 cm. long, stigma entire; pedicels 0.2–0.3 cm. long, ascending; seeds brown, striate-reticulate, winged, about 0.2 cm. long, cotyledons accumbent.

Serpentine outcrops in Marin County, California, Mt. Tamalpais, North Side Trail, one-fourth mile northeast of Rifle Camp, June 8, 1937, *J. L. Morrison 2493* (type, Herb. Univ. Calif. no. 575762); May 23, 1937, *J. L. and F. L. Morrison 2363* (Herb. Univ. Calif.); Big Carson Ridge, 5.5 miles northwest of Mt. Tamalpais, between Pine Mountain and San Geronimo Ridge, May 30, 1937, *J. L. Morrison 2440* (Herb. Univ. Calif.).

*Streptanthus batrachopus* is known at present only from two outcrops of serpentine in Marin County. The plants are fairly abundant locally, growing in serpentine talus. Associated plants include: *Allium falcifolium* Hook. & Arn., *Cheilanthes siliquosa* Maxon, *Eriogonum vimineum* Dougl. var. *caninum* Greene, *Streptanthus glandulosus* Hook. var. *pulchellus* (Greene) Jepson, *Epi-lobium minutum* Lindl., *Arenaria Douglasi* Fenzl, *Ceanothus Jepsoni* Greene, *Arctostaphylos montana* Eastw., *Quercus durata* Jepson and *Cupressus Sargentii* Jepson. Careful exploration of the many other serpentine outcrops in the Mt. Tamalpais area has so far failed to extend the range of this species. This name was chosen because of the resemblance of the leaves of this species to a frog's foot.

This species seems to be most closely related to *Streptanthus Breweri* Gray, a serpentine endemic ranging in the inner and middle Coast Ranges from Tehama County to San Benito County. The key below indicates the differences between the two species:

- Leaves broadly ovate, remotely denticulate to entire, sessile or with a very short petiole, auriculate, concolorous above at maturity, average length 4.1 cm.; flowers many, 0.6–0.8 cm. long; stigma sessile; seeds wingless ..... *Streptanthus Breweri*
- Leaves spatulate-obovate, saliently few-lobed, long-petioled, anthocyanous below, greenish-yellow above, mottled with brown, purple or red; average length 1.2 cm.; flowers few, 0.4–0.6 cm. long; style 0.1 cm. or more in length; seeds winged ... *Streptanthus batrachopus*

*Streptanthus callistus* sp. nov. Herba annua, compacta, omnino sparse hispida; caules erecti, 3.0–6.0 cm. alti, simplices vel plerumque ramosissimi, ramis divaricatis, apicibus adscendentibus; folia basalia subsessilia, oblongo-orbiculata, crasse dentata, 0.2–0.6 cm. longa; folia superiora orbiculato-obovata vel oblonga, basi lata, auriculata, amplexicaulia, dentata, 0.5–1.5 cm. longa, 0.4–1.4 cm. lata, saepe rubescentia, pilis rigidis, hyalinis, attenuatis, utrinque sparse hispida; racemi flores terminales steriles re-

ducti, calycibus elongatis, hispidis, partibus ceteris obsolescentibus; flores fertiles numerosi; pedicelli, breves, crassi, adscendentes; sepala viridia, hispida, ovato-lanceolata, acuta, saccata, dorsaliter carinata, 0.5 cm. longa; petala purpurea, conspicue, venata, spatulato-oblongata, obtusa, 1.0 cm. longa, marginibus undulatis albidis, laminis 5 cm. latis; stamina triseriata, antheris leviter sagittatis, superiorum filamentis 0.6 cm. longis fere usque ad apicem connatis, antheris reductis, inferiorum filamentis 0.4–0.5 cm. longis, usque ad 0.2–0.3 cm. connatis, antheris longioribus, lateralium filamentis 0.3 cm. longis, liberis, approximatis, antheris longissimis; siliquae 1.5–2.0 cm. longae, teretes, erectae, incurvatae, attenuatae, valvis conspicue uninervatis, pilis complanatis, hispidis; septorum cellulae tortuosae; semina olivacea, globosa, non alata; cotyledones accumbentes.

Low compact annual, sparingly hispid throughout; stem erect, simple or mostly much branched, branches at right angles to the main stem, curving upwards, 3.0–6.0 cm. high; basal leaves sessile, 0.2–0.6 cm. long, oblong-orbicular, coarsely dentate; upper leaves sessile, 0.5–1.5 cm. long, 0.4–1.4 cm. wide, dentate, often reddish, very sparsely hispid above and below with stiff, hyaline, tapered trichomes, orbicular-obovate to oblong, base broad, auriculate-clasping; raceme terminated by sterile flowers reduced to elongated, hispid calyces, with petals, stamens and pistil rudimentary; fertile flowers numerous on short, stout, hispid, ascending pedicels; sepals 0.5 cm. long; green, hispid, ovate-lanceolate, acute, keeled, saccate; petals mulberry purple<sup>1</sup> to cotinga purple with prominent veins, 1.0 cm. long, spatulate-oblongate, obtuse, margins undulate, whitish, lamina 0.5 cm. wide; stamens in three pairs, anthers slightly sagittate; upper filaments 0.6 cm. long, connate nearly to the apex, anthers reduced; lower filaments 0.4–0.5 cm. long, connate for 0.2–0.3 cm. anthers longer; lateral filaments 0.3 cm. long, free, approximate, anthers longest, free tips of the connate filaments mulberry purple; silique 1.5–2.0 cm. long, terete, erect, incurved, tapering, valves with a strong midvein, hispid with flattened trichomes, cells of the septum all tortuous; seeds greenish-brown, orbicular, not flattened, wingless, cotyledons accumbent.

<sup>1</sup> Color Standards and Nomenclature. Robert Ridgway. Washington, D. C. Published by the author. 1912.

#### EXPLANATION OF THE FIGURES. PLATE XXXI

PLATE XXXI. Figs. 1–10, *Streptanthus callistus* Morrison: 1 habit; 2 terminal cluster of sterile flowers; 3 flower; 4 petal; 5 seed; 6 flower; 7 androecium and gynoecium; 8 leaf; 9 silique; 10 sepal. Figs. 11–15, *Streptanthus hispidus* Gray: 11 seed; 12 habit; 13 leaf; 14 androecium and gynoecium; 15 flower. Figs. 16–19, *Streptanthus insignis* Jepson: 16 seed; 17 leaf; 18 flower; 19 silique. Figs. 20–28, *Streptanthus batrachopus* Morrison: 20 silique; 21 habit; 22 sepal; 23 flower; 24 petal; 25 androecium and gynoecium; 26 leaf; 27 seed; 28 leaf. Figs. 29–31, *Streptanthus Breweri* Gray: 29 silique; 30 leaf; 31 seed.

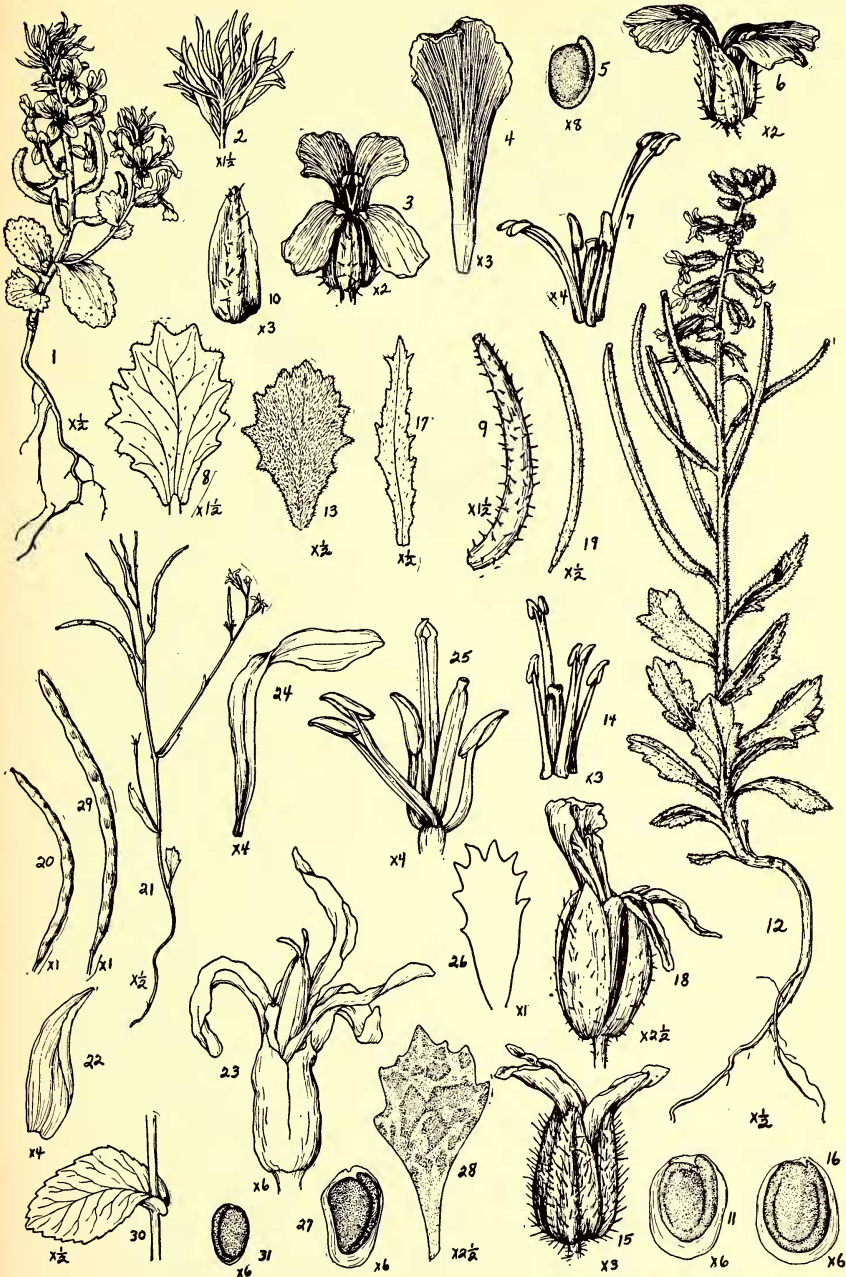


PLATE XXXI. COMPARATIVE DRAWINGS OF FIVE SPECIES OF STREPTANTHUS.  
 (See explanation of figures on page 206.)

Arroyo Bayo, Mt. Hamilton Range, Santa Clara County, California, 6.8 miles east southeast of Isabel Creek on the road to San Antonio Valley, elevation 2000 feet, May 5, 1935, *C. W. and H. K. Sharsmith 3074* (type, Herb. Univ. Calif. no. 575766; isotype, Gray Herbarium); May 13, 1937, *D. D. Keck and J. Clausen 4541* (Herb. Carnegie Inst. Wash., Stanford Univ.); April 27, 1938, *J. L. Morrison and A. Carter 3019* (Herb. Univ. Calif.).

*Streptanthus callistus* was discovered by Herbert L. Mason, Carl W. and Helen K. Sharsmith in 1935. In 1937 a few plants were collected by David D. Keck and Jens Clausen who report it as "very rare." The writer collected mature siliques and seed in this area in October, 1937, and on April 27, 1938, the plants were found to be abundant in the area. This very narrow endemic, known only from the type locality, occupies low, south-facing knolls, where the soil is very loose and dry. Associated with it are found: *Malacothrix obtusa* Benth., *Eriogonum* sp., *Chaenactis glabriuscula* DC., *Mimulus Bolanderi* Gray, *Lessingia germanorum* Cham., *Linanthus Bolanderi* (Gray) Greene, and *Salvia columbariae* Benth. The species name is derived from a Greek word meaning most beautiful.

This plant is related to *Streptanthus hispidus* Gray, known only from Mt. Diablo, from which it is readily separated by the short, terete, curved pods with small, rounded, wingless seeds. *Streptanthus insignis* Jepson, known from the inner South Coast Ranges of western Fresno, San Benito and eastern Monterey counties, is also related to *Streptanthus callistus* by reason of the similarity in the terminal, sterile flowers. These three related species may be distinguished by the following characters:

Siliques flattened, straight, erect, 5.0-7.0 cm. long; seeds winged, 0.2 cm. long.

Plants densely hispid, low, compact, 5.0-30.0 cm. high; leaves spatulate-oblongate, saliently lobed, reddish or purple below; blade of petal light purple, calyx densely hispid, sterile flowers either very rarely present or slightly developed, not forming a terminal color spot; stigma entire . . . .

*Streptanthus hispidus*

Plants sparsely hispid, slender, 10.0-45.0 cm. high; leaves deeply lobed, almost pinnatifid; blade of petal white, with a black-purple midvein, calyx purple, sparsely hispid, terminal cluster of sterile flowers always present, black purple or garnet, forming a prominent terminal color spot; stigma slightly two lobed . . . . .

*Streptanthus insignis*

Siliques terete, incurved, erect, 1.5-2.0 cm. long; seeds not flattened, wingless, 0.1 cm. long . . . . .

*Streptanthus callistus*

University of California, Berkeley,  
March 15, 1938.